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The usefulness of the ICF framework in goal setting for students with autism spectrum disorder

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Abstract

An Individualized Education Plan (IEP) is a multi-disciplinary, team-developed plan that is required for a child receiving special education services. IEPs are tools for setting objectives that are responsive to students with special needs. The International Classification of Functioning, Disability and Health (ICF) is a hierarchical classification for human functioning and disability developed by the World Health Organization (WHO). The ICF classification can be used as a structural and conceptual instrument in goal setting. In this study the educational IEP objectives of five Finnish students with autism spectrum disorder (ASD) are examined within the ICF framework. The focus is in the goals concerning the development of communication and social behavior because the main criteria for ASD comprise disabilities and challenges in communication and social behavior. The aim of the study was to assess the usefulness of the ICF coding system with regard to educational goals and objectives of students with ASD. The core content of the goals was extracted to linking units, which were coded into categories of the ICF classification. The results revealed that only few of possible ICF categories were used, the goals linked to communication technologies were heavily stressed, and the relation between the goals and general curriculum was vague. As a conclusion it is suggested that teachers and multi-disciplinary teams might benefit from standardizing their mutual conceptual framework with the help of the ICF when setting goals or objectives for students with disabilities.

Keywords: Autism Spectrum Disorder; ICF; special education; goal setting; Finland; IEP; communication; interaction

Individualized education plans (IEPs), also known as individual or individualized learning programs, are widely thought to be an essential part of the framework of special education (Ruble, McGrew, Dalrymple, & Jung, 2010). An Individualized Education Plan is a multi-disciplinary, team-developed plan that is required for every child receiving special education services, including students with autism spectrum disorder (ASD), Asperger's disorder (AS), and attention deficit hyperactivity disorder (ADHD). IEPs are tools for recording and tracking goals and objectives that have been designed to match the individual requirements of students with special needs. In Finland, individual education plans are called *Henkilökohtainen opetuksen järjestämistä koskeva suunnitelma* (in English: A personal plan for educational arrangements). Implementation of each IEP is monitored and assessed on a yearly basis (Basic

Education Act, § 17, 2010; Finnish National Board of Education, 2014).

In Finland the contents of each IEP are based on the National Core Curriculum for Basic Education (Finnish National Board of Education, 2014). The IEP must detail the way in which instruction and the required support are arranged. Accordingly, each plan should include a description of the student's learning abilities and strengths, both short- and long-term objectives for instruction and learning, and the communication techniques, special aids, and learning materials to be used. An IEP should also record the individual's experiences with support services, as well as the functional approaches and instructional arrangements that support the student's development and learning. It is important to assess and monitor such students regularly, especially during transitions from one educational level to another. If needed, instruction is provided by activity area. Activity areas included in the curricula are motor skills, language and communication skills, social skills, skills in daily functions, and cognitive skills (Finnish National Board of Education, 2014).

Educational Setting in Finland

Education in Finland starts in the year when a child turns seven and lasts nine years. Local authorities assign a school place to each pupil close to their homes, but parents are free to choose the comprehensive school of their preference, with some restrictions. Basic education is provided within a structurally unitary school system. So, there is no division into primary and lower secondary education. Instruction is usually given by the same class teacher in most subjects in the first six year-classes and by subject specialists in the last three years. The ideology is also to provide special needs education primarily in mainstream education. If a pupil cannot be taught in a regular teaching group, he or she must be admitted to special needs education. This education is also provided within regular schools wherever possible (Finnish National Agency for Education, 2017).

Autism Spectrum Disorder

One of the disabilities that requires specialized instruction is Autism Spectrum Disorder (ASD), which is a neurodevelopmental disorder characterized by persistent impairment in reciprocal social communication and social interaction (American Psychiatric Association, 2013). This condition also exhibits restricted and repetitive patterns with regard to behavior, interests, and activities (American Psychiatric Association, 2013). All learning is based on flexible interaction, which requires spontaneous, expressive communication (Chiang & Carter, 2008). One of the deficits linked to ASD is related to the initiations of social interaction and spontaneous communication (Drain & Engelhardt, 2013), which considerably hampers learning.

Despite the legal prerequisites for providing IEPs for students with ASD, there is little research related to the content, effectiveness, and outcomes of IEPs (Ruble et al., 2010; Wilczynski, Menousek, Hunger, & Mudgal, 2007). The capacities of students with ASD vary between exhibiting strengths and challenges in specific areas (American Psychiatric Association, 2013). Defining individually functional goals requires the identification of the personal characteristics on which such goals can be based.

Individually defined goals constitute an essential part of IEP content because conscientious goal setting has proven to be an effective instrument for behavior modification (Scobbie, Dixon, & Wyke, 2011). Moreover, goal setting and especially making it public enhances commitment to an activity and increases motivation (Latham, Seijts, & Crim, 2008).

Students with ASD are often deeply interested in specific topics (American Psychiatric Association, 2013). For example, they can put all their efforts on examining solely the Middle Ages or intensively study frogs. These special interests can be utilized in goal setting. Cognitive profiles may also be very different between ASD cases, so goal setting can be at a very high or low level according to the intellectual level of the pupil (Lord & Jones, 2012; Macintosh & Dissanayake, 2004).

The relationship between the time spent on a task and the intensity of effort is also relevant to achieving the goal successfully. When the individual can control the time he or she spends on a task, difficulties in achieving the goal lead to prolonged effort (Kupiainen, Vainikainen, Marjanen, & Hautamäki, 2014). Previous research supports that it is also possible to achieve a difficult goal in two ways: by working faster and more intensely for a short period, or by working more slowly and less intensively (Scobbie et al., 2011).

When setting goals, it is important to take into account the individual's self-regulation abilities, because by self-regulation individuals manage their emotions and behaviors (Zimmerman, 2000, 2008). Zimmermann (2000) formulates it clearly: "Perhaps our most important quality as humans is our capability to self-regulate" (p. 13). Self-regulation comprises important components related to learning that include setting goals, attending to and concentrating on instructions, using effective strategies to organize information, monitoring performance, seeking assistance, holding beliefs about an individual's ability to achieve a desired goal, and anticipating outcomes (Schunk & Ertmer, 2000; Wery & Nietfeld, 2010). Self-control and self-regulation of behavior and emotions are typical challenges in ASD (American Psychiatric Association, 2013; Carr, Moore, & Anderson, 2014) and must be taken into account when setting goals for students with ASD. Individuals with ASD, like other individuals, learn about the requirements of each goal and the skills needed

to achieve each goal. The previously acquired knowledge and skills relevant to goal attainment affect how the individual will confront the task (Kreibig, Gendolla, & Scherer, 2010; Senko & Hulleman, 2013).

Achieving a goal is only one part of the goal pursuing process, because the individual is also seeking some concrete outcome that will be valuable or useful. Thus, the outcome that the individual hopes or expects to achieve encourages that person to attempt difficult goals (Wigfield & Eccles, 2000). Outcome expectancies also increase resilience in dealing with obstacles along the way, because they enhance motivation and enhanced motivation leads to improved outcomes (Scobbie et al., 2011; Øien, Fallang, & Østensjø, 2009; see also Harkin et al., 2016). People with ASD usually have some strong interests, which can be tied to goal setting to make the possible outcomes more compelling.

When setting goals, it is important to take into account the environment in which the goals are activated in order to ensure that full participation is possible. Students' personal characteristics and desires must be taken into account, because these factors have an effect on students' commitment to pursuing the goal (Scobbie et al., 2011). If there are numerous goals, they need to be prioritized based on resources, for example, prioritize the time needed for achieving the goals. Large, complex, or demanding goals should be divided into smaller pieces. Tangible or concrete goals, which are usually easier to achieve, can be used to ensure success (Bovend'Eerdt, Botell, & Wade, 2009; Playford et. al, 2009; Turner-Stokes, 2009).

International Classification of Functioning, Disability and Health

The International Classification of Functioning, Disability and Health (ICF) is a hierarchical classification application developed by the World Health Organization (WHO, 2001). In ICF, the term 'functioning' refers to all body functions, activities and participation (WHO, 2001, p. 3).The ICF provides a framework for coding a wide range of information about health, for example on diagnosis, functioning, and disability, and reasons for contact with health services (WHO, 2001). It uses a standardized common language: the importance of a uniform use of language and conceptual constructs is particularly important in multi-vocational collaboration, such as in the education of students with ASD. The World Health Organization has produced a version of the ICF for children and young people named the International Classification of Functioning, Disability and Health for Children and Youth (ICF-CY) (WHO, 2007). The ICF-CY is not yet available in Finnish. In order to avoid conceptual misunderstandings, the authors chose to use the original ICF, which is available in the Finnish language.

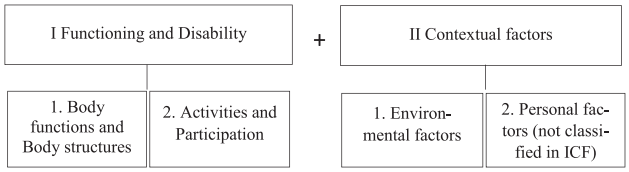

Figure 1. The parts and components of the International Classification of Function, Disability and Health, ICF (WHO, 2007)

The ICF has two parts, the first of which deals with functioning and disability (I), and the second consists of contextual factors (II). Both parts have two components (WHO, 2007). The functioning and disability part contains components linked to physiological functions of body systems (including psychological functions) and body structures. Another component of the first part is called activities and participation. Activity is defined in the ICF as the execution of a task or action by an individual. The second part of the ICF includes two contextual factors, which are environmental factors and personal factors. The environmental factors constitute the physical, social and attitudinal environment in which people live. The parts and components of the ICF are shown in Figure 1.

Each component of the ICF mentioned above consists of various domains. Categories within each domain comprise the units of classification. For example, category *d3351* includes issues linked to Producing signs and symbols. This category is a sub-category of *d335* (Producing nonverbal messages), which belongs to one section of the Communication domain (d3), namely, Communicating – producing. The Communication domain is a part of the Activities and Participation component, which belongs to the Functioning and Disability part of the ICF. This example of the hierarchy in the ICF classification is illustrated in Figure 2.

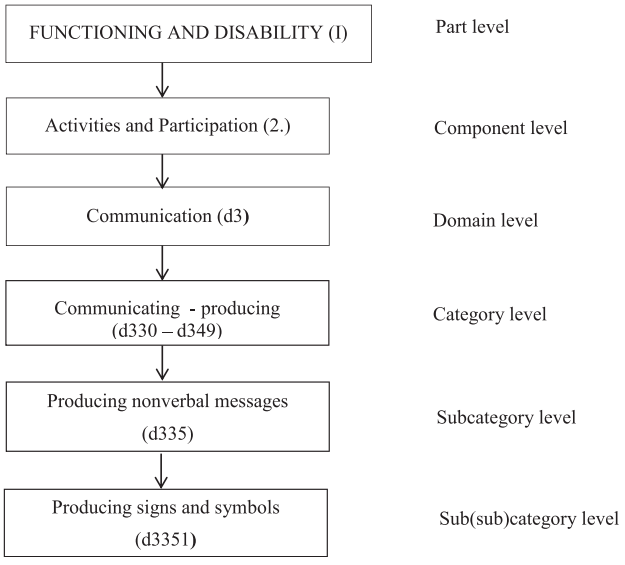

Figure 2. An example of the hierarchy in the ICF classification

Table 1.
Activities and Participation: Information Matrix

Domains	
d1	Learning and applying knowledge
d2	General tasks and demands
d3	**Communication**
d4	Mobility
d5	Self-care
d6	Domestic life
d7	**Interpersonal interactions and relationships**
d8	Major life areas
d9	**Community, social and civic life**

Note. The ICF domains of the Activities and Participation component of the ICF classification system. The essential domains for this study are d3, d7, and d9 (bold). These domains are linked to the main challenges in ASD, it is, disabilities and impairments in social interaction and communication.

The flexibility and multi-functionality of the classification becomes apparent when coding abilities, skills, and functioning of individuals. It is possible to use codes to describe functioning at every level of categorization. The codes can either be independent or connected to each other. Thus, there is the potential to use the ICF as a structural and conceptual tool when writing goals aimed at improving or developing various domains of functioning. With the help of the ICF, it is possible to make the various components of functioning visible by making them tangible (WHO, 2001).The strength of the ICF in terms of goal setting lies in its comprehensiveness and flexibility when classifying various life situations. The conceptual coherence of the ICF provides all vocational groups with a common language for functioning, which multi-disciplinary teams can use to build a framework for mutual collaboration (WHO, 2001). The active education, upbringing, and rehabilitation of individuals with ASD require a working multi-disciplinary entity or group to ensure optimal development. It is remarkable that the ICF shies away from using a medical model of disability and functioning which presents a problem-centered approach. Instead, the ICF framework prefers the integration of various perspectives of functioning which stands for a biopsychosocial approach (WHO, 2001). The ICF also stresses that individuals with disabilities should be active participants in their communities (Miettinen, 2010). Raghavendra, Bornman, Granlund and Björck-Åkesson (2007) suggest that using an ICF-CY-based instrument to assess needs leads to goals that are more oriented toward participation and the environment. Goals that support participation in communal activities and living environments are essential for people with ASD considering their overall challenges in interaction and communication. An opportunity to engage in the activities of one's community is a matter of quality of life. Nirje (1985) proposed that the goal of "making available to all persons with disabilities patterns of life and conditions of everyday living which are as close as possible to the regular circumstances and ways of life of society" (p. 67) should be visible in every IEP.

Nirje's participation-oriented perspective suits educational organizations very well, but using an ICF framework in schools is unusual. ICF framework applications in an educational context has been studied, for example, in Japan (Mita, 2012), Switzerland (Hollenweger, 2011, 2013) and Portugal (Castro, 2014). In Finland, the use of ICF framework in a school context is still very rare but Rämä and her colleagues examined educational goals in the framework and noticed a shortage of environmental goals (Rämä et al., 2013). They also noticed that the goals set were also extremely general. As a conclusion, they argue that vaguely written goals can be interpreted in many ways, and problems with interpretation challenges the assessment.

Research Aim

The research question of this study was 'How the use of the ICF coding system contributes to IEPs for individuals with ASD?' The aim of this study was to assess the usefulness of the ICF coding system in the context of educational goals and objectives of students with ASD. The paper focuses specifically on the IEP goals and objectives that are linked to communication and social development. This focus ties to the main criteria for ASD, which comprises disabilities and challenges in communication and social behavior. In this study, the students' IEP objectives concerning communication and social behavior were linked to the ICF categories in the Activities and Participation component, which includes domains such as Communication (domain d3 in ICF classification), Interpersonal interactions and relationships (domain d7), and Community, social, and civic life (domain d9). The ICF domains of the Activities and Participation component of the ICF classification system are listed in the information matrix in Table 1.

METHOD

Participants

The participants whose IEPs were examined in this study comprise five Finnish males in the same special education class. All students had been diagnosed with ASD and were about 12 years old at the beginning of the study (2006) and between 19 and 20 years old at the end of the study (2014). The students did not have significant sensory impairments with regard to sight or hearing and they had no problems in movement. As a result of the differences in means of adequate communication among

the students, different communicative approaches were used including pictures, picture folders, photographs, movable stickers, picture directories, speech generating devices (personal communicators), manual signs, verbal communication, gestures and other bodily movements, facial expressions, gazes, vocalizations, communication boards, and voice output communication aids. This variety of communicative approaches was also present in the students' IEPs. Their teacher was a qualified special education teacher with over 20 years of experience. The same combination of students continued in the class throughout the length of the study, and the same teacher took responsibility for the students throughout their school years. The names of the students have been changed to preserve anonymity.

Data Collection

All IEPs were written and examined on the basis that instruction was to be provided by activity area. In this context, language and communication and social skills areas were especially interesting with regard to the challenges faced in ASD. The educational goals linked to interaction and communication were collected from the IEP forms of the students in a particular special education class in a Finnish school in the years 2006–2014. All schools in Finland follow a national core curriculum, which includes the objectives and core contents of different subjects. The education providers, usually the local education authorities and the schools themselves draw up their own curricula within the framework of the national core curriculum. The school in the study had its own general description of goals linked to communication, which was based on the National Core Curriculum for Basic Education (Finnish National Board of Education, 2004). The description included essential objectives, such as encouraging orientation and understanding, and producing various expressions. The means to achieve these goals were the use of spoken language or augmentative or alternative communication (AAC) in a way that allowed the individuals to express themselves, their inner feelings, and their experiences. Consciousness of language and nonverbal expressions were included in the school curriculum. The development of a student's interactional skills in social relationships and in various environments was a social skills target. The area of social skills included recognizing feelings, eye-contact, interactional skills, interaction with objects, self-control, and social life (Finnish National Board of Education, 2014).

The study included a total of 47 student IEP forms. These were written between 2006 and 2014. Sometimes only the dates were changed between years for particular goals, i.e., a completely new IEP was not written for the year in question. These forms were counted as new forms in this study. Some students had two different IEPs for the same school year. Although a number of nonacademic goals were also included, students with special needs in this study had IEPs in which the pedagogical aspect was emphasized. The goals linked to communication and social development aimed to enhance students' learning abilities and could be considered as partly instrumental and partly linked to rehabilitation. The researchers carefully read through the IEP forms and collected all the goals within the communication and social skills areas. Thus, the data consisted of objectives linked to developing students' communicative and social skills. One or more sub-goals could be recorded within a single goal; however, these sub-goals were classified as independent goals in order to outline the analysis. In some IEP forms, a number of goals were tagged for continuation during the next school year. However, it was not usually clear whether this continuation concerned all or some of the goals on the form. Such goals were not included in the data due to their vagueness and non-systematic nature. Although the IEP forms included some goals that were probably related to interaction with other people (social issues), they were excluded if their main focus was not on developing communicative or social skills. Not all IEP forms included the goals under investigation every year.

Table 2.
The Number of the IEP Goals Analyzed in This Study

Student	IEP forms	IEP goals	Deleted goals	Final goals
Richard	17	28	4	24
Ralph	6	22	2	20
Samuel	10	27	0	27
Eliah	5	19	1	18
Henry	9	27	1	26
Sum	47	123	8	115

Note. The first column (on the left) consist of the participants, whose names are anonymized. The second column includes the number of individual IEP forms of the students. In the third column, the study goals are divided based by individual students. The last two columns consist of the numbers for deleted/final goals.

The final number of goals was 123, of which eight were deleted. The deleted goals were not in the area directly under examination. They addressed mechanical performances, such as obeying a code of conduct in order to achieve a certain level of performance. Thus, the data analyzed comprised 115 goals. In the final data, the number of goals for each student varied from 18 to 26. The detailed division of the goals is presented in Table 2.

Data Analysis

The study included a total of 47 student IEP forms. These were written between 2006 and 2014. The IEP forms of Ralph and Eliah were available only for years 2010–

2013, so the number of their goals is lower than others. On the other hand, the IEP forms of Richard cover all the years 2006–2014 that becomes apparent also in the number of his goals. However, the number of ICF forms of Samuel and Henry are much lower than Richard's but the number of the goals is about the same size. This is due to counting dated goals as new IEPs even if the whole IEP content was not re-written.

Most goals in the IEPs were clearly expressed, and the core content of the goal was usually easy to extract. For example, the goal could be "Asking for help" (number of the goal in the data, Ju17), "Working actively with others in morning meetings" (Je8), "Expressing oneself" (O2), or plain "Communicator" (Ju1). If there were two or more sub-goals within the main goal, the parts were differentiated. As a result, the core content of each goal was extracted to linking units, which were the actual units of analysis. These units were coded into categories from the ICF classification and their frequencies were counted. The goals were linked to the Communication (domain d3, 58% of all goals), Interpersonal interactions and relationships (d7, 37%), and Community, social and civic life (d9, 1%) domains in the Activities and Participation component of the ICF. A few goals were linked to the General tasks and demands (d2, 4%) domain because they were closely related to social behavior.

Classification of the goals was also reinforced by asking other researchers for comments concerning the given category codes. The commenting researchers are very experienced in the field of special education and are also specialized on communication and interaction of the pupils with severe and profound intellectual disabilities. The researchers agreed that the codes were appropriate. In order to verify the categorization process, the categories of the linking units were also compared to those found in prior studies (Rämä et al., 2013).

Domains and categories of the Environmental factors component were not included because these categories focus on the facilitators of, or obstacles to, developing skills rather than on the skills of the students. For example, other people's attitudes could be coded as an environmental factor.

Results

Two domains, Communication (d3) and Interpersonal interactions and relationships (d7), contained 95 % of all the goals. More than a half (58%) of all the goals fell within the Communication domain (d3). Here, goals linked to the use of communicators or corresponding/similar technologies (d3608) constituted 54% of the goals in this domain, whereas goals linked to spoken language constituted 24% (d330). A typical example is "Increasing the use of the communicator" (number of the goal in the data, Ju14) or "Using Roll-talk in communication" (O3). "Expressing oneself" (category d335) was formulated as a major goal in four cases (3.5% of all goals).

The Interpersonal interactions and relationships domain (d7) represented 37% of all goals. Half of d7 goals fell within the Interacting according to social rules sub-category (d7203). An example of this kind of goal is "To act in a group by following instructions" (E13). A sub-category of Complex interpersonal interactions, other specified (d7208) contains 26% of the goals in this domain, and consists of goals that are targeted toward asking help from other people. The rest of the d7 goals were divided into four minor groups like Physical contact in relationships (d7105, 5%), Complex interpersonal interactions (d720, 1%), Forming relationships (d7200, 8%), Regulating behaviors within interactions (d7202, 8%).

DISCUSSION

The aim of this study was to assess the usefulness of the ICF coding system with regard to the educational goals and objectives of students with ASD. The goals chosen for the IEPs analyzed in this study were based on the Finnish Basic Education Act and Core Curriculum. The curriculum can also be organized by activity area if a student has been officially denoted in need of special education support. The rough division of the goals into two main sections (d3 and d7) was to be expected considering the focus of the data. However, it could also be a sign that the goals were set too unilaterally. This is confirmed by the fact that it was possible to place these goals into only a few sub-categories within the domains. In the ICF classification, there are 42 categories and sub-categories in the Communication domain (d3) alone. In our study, the goals linked to this domain included only six of these ICF categories, and most of the goals could be placed within only two of these categories. It may be that when the goals were set, attention was focused only on those issues thought to represent the core challenges for these students.

Certainly, challenges linked to communication and social behavior are crucial in ASD (American Psychiatric Association, 2013). However, from the pedagogical perspective, more multifaceted and future-oriented aspects should also be taken into account. The connection between communicative and social goals and academic objectives should also be clearly articulated. It is important to recognize that the goals set in basic education have consequences in further education or advanced training (Doren, Flannery, Lombardi, & McGrath Kato, 2012). Long-term functional goals should address the development of communication and social behavior in such a way that students obtain skills that are transferable to situations and activities outside the school and in adult life (Iovannone, Dunlap, Huber, & Kincaid, 2003). The proportion of the objectives linked to the use of communicators or corresponding/similar technologies

(54% of the domain) is quite large in relation to the school's general goals for communication. The relationship between the technologies and objectives mentioned in the school curriculum was not articulated when reading the goals. For example, one goal is simply stated as "Communicator" (Ju1), without any reference to the functional target of that goal. However, the ICF classification enables more specific goal analysis and goal setting by the creative use of its categories. For example, the description of the goals linked to a conversation between two people can be expressed with the help of categories d350 (Conversation) and d355 (Discussion), along with their sub-categories d310–d349 (Communicating – receiving or producing messages). With the ICF, it is possible to take better account of societal and communal factors when setting goals.

The prioritizing of goals linked to communicators or similar technologies implies that these objectives are basic in nature. It infers that goals relating to social behavior and interaction are subordinate to communicative objectives. In practice, a student is supposed to know how to communicate before he or she is able to interact. However, it may be more natural to believe that communication and interaction develop concurrently (Bottema-Beutel, 2014; Fogel, 1993; Topping, 2013).

Speaking-related goals account for 14% of all goals. In the domain of Communication, the relational proportion of speaking goals was 24%, which was quite substantial when taking into account the fact that every student in this study used some kind of AAC device. Although the ability to speak is useful when acting outside of the school context, it is questionable whether this emphasis on speaking is justified. This emphasis may indicate an underestimate of the student's own more characteristic way of communicating.

Expressing oneself is a central objective in the school curriculum, but this objective was formulated in only a few goals in sub-category d335 (Producing nonverbal messages). Although it would seem sensible to utilize natural gestures resembling sign language when interacting with people without sign language skills, the goals linked to the use of sign language formed only a small sub-category of communication (two references, in excerpts H2 and H12). The emphasis on communication technologies seemed to have the opposite effect on the amount of the goals related to other communicative means.

The objectives in the Interpersonal interactions and relationships domain (d7) constituted 36.5% of all goals. Half of the goals in this domain were placed within the Interacting according to social rules sub-category (d7203). It is interesting that almost every goal relates to acting in a group. This implies that interaction is conceived of as happening between many persons, not in dyadic relationships. Although acting in a group is certainly an important part of school work, the unique and original ways of interacting that are typical in ASD are present in all relationships, not only in groups. Regulating behaviors within interactions (d7202) contained four goals, which were all were linked to controlling tantrums. In ASD, persistent deficits in social communication and social interaction skills (ICD-10, DSM-5) can be observed when an individual attempts to make contact with other people. This challenge was only represented in three goals (sub-category d7200), two of which were set for a single student. The ability to find and establish friendships and keep them alive is an essential part of developing students' interactional skills, as mentioned in the school curriculum. The ICF classification offers a much wider base with which to describe the interaction between people and includes comprehensive descriptions of interactional functioning. These descriptions can be utilized increasingly when setting goals for this domain. For example, categories d710–d729 (from the General interpersonal interactions domain) include tangible indications that goals should be set in order to develop social skills. Categories like Giving and reacting appropriately to signs and hints that occur in social interactions (d7104), Tolerance (d7102), Criticism (d7103), Appreciation (d7101), and Respect and warmth in relationships (d7100) give clear and illustrative hints of the possible content of interactional goals.

It is surprising that the relative proportion of the goals linked to Asking for help (d7208) were so large (26% of the domain and 9.5% of all goals). Both the ICF classification and the Finnish Core Curriculum emphasize the individual's own active and committed relationship with his or her environment. In contrast, the strong emphasis on asking for help seen in this study implies a position in which the students are dependent on other people. This means that their participation in social life is also dependent on other people. These goals made a continuum over years, which confirm the implications drawn in this study.

Within the domain of Community, social and civic life (d9), only 1 goal (1% of all goals) that concerned training for independent housing (H27) was mentioned. This scarcity of goals linked to civic life is interesting because the students in the study were due to leave the school at the end of the study period. Another domain seldom used was General tasks and demands (d2), which included five goals. These goals mainly concerned challenges from ritualistic behavior (getting stuck in repeating certain actions) or being in one's own world (involving oneself deeply in something), which are typical in ASD.

Reliability of the Study

The reliability of this study depends on how carefully the data are linked (bridged) to the ICF classification. The detailed description of the ICF classification in this study is therefore aimed at making the reader familiar with the categorization and helping the reader to understand the

process (Janesick, 2000). The ICF categorization is hierarchically structured and proceeds from the general to more specific and concrete levels. As a result, it was always possible when bridging the goals, to go down the categorization steps to find a category that was sufficiently concrete to represent a goal (linking unit). These characteristics of the ICF classification helped ensure the bridging process and made it more trustworthy. Replication of the study also demands a clear description of the ICF and its structure. In this study, the linking process greatly benefitted from a prior study performed in the Ruskeasuo School (Rämä et al., 2013). In addition, researchers in this study discussed the principles of bridging, negotiated problematic items, and standardized the coding guidelines of the goals (Seale, 2004). The ICF-linked goals and the categories of the linking units were compared to the work in the prior study and were congruent. The clarity and conceptual solidity of the ICF framework made the linking process easier and simpler.

The activity area curriculum of the school in this study included goals that were often placed in the domain of Mental functions (b1) (within the Body Functions and Body Structures components) within the ICF. This caused confusion because, according to the IEP writers, these goals also belonged within the Activities and Participation part of the ICF. Thus, using the ICF classification highlighted a conceptual difference regarding the fundamental nature of determining goals.

Limitations of the Study

A well-written description of the study process is a criterion for a good scientific article. Other researchers should be able to replicate the study using the information placed in the article in question. In our case, using the ICF classification proved to be very laborious because of its numerous categories. This exposes researchers to the possibility of confusion with and misunderstanding of the contents of the ICF. Another limitation and a weakness of the study relates to the way some goals were written. There were goals that constituted a single word, such as "Communicator" (Ju1), or goals that were too general, like "Being interactive in the morning meetings" (Ju3), without any specifics. These kinds of goals were easy to classify but the meaning or context remained too vague.

As an implication of all the issues mentioned above concerning reliability and trustworthiness we propose that studying educational or pedagogical goals in the framework of the ICF demands a strong conceptual uniformity between the contents of the studied goals and the ICF categories. This uniformity makes the link between those two possible.

Conclusion

Although the ICF serves as a framework to organize information collected from descriptions of health and health-related states (i.e. human functioning and its restrictions), it is possible to use it for other purposes and contexts. Scrutinizing IEP goals within the framework of the ICF revealed deficiencies in determining goals for students with ASD. As a conclusion, the researchers of this study suggest that students with special needs may benefit if teachers adopt an ICF perspective when writing their IEPs. The conceptual environment shared by all the actors (students, teachers, parents, and multi-disciplinary workers) would be more coherent using the ICF framework.

Although the ICF classification system has its advantages, it is very laborious to use, especially in a school context. It would be sensible to develop a more compact, teacher-friendly version of the ICF. Alternatively, multi-occupational or collaborative teams could include at least one person with ICF knowledge.

According to our study, it is possible to detect differences in content between a curriculum and an IEP using the ICF framework. With the help of the clearly determined concepts in the ICF, harmonization of the curriculum and the IEP could succeed. As in another review of 319 international references concerning IEPs (Mitchell, Morton, & Hornby, 2011), it is obvious that the purpose of IEPs is not always clear to those who write them. Mitchell et al. (2011) conclude that IEPs often have multiple purposes: the same document is expected to serve educational, legal, accountability, placement, and resource allocation purposes. In this study, it seems that the primary objective of an IEP, which is to act as an instructional framework, is being lost. This study's conclusion that the contents of the IEPs were insufficiently connected to the curriculum is in line with the research literature (Mitchell et al., 2011). The IEPs in this study seem to function more as documentation for legal compliance (Hirsch, 2014; Shaddock, MacDonald, Hook, Giorcelli, & Arthur-Kelly, 2009; Vallberg Roth, & Månsson, 2006) rather than as an adequate educational plan for each individual.

It should be noted that the focus of the study was on written IEP documents, not on any actual teaching processes. No conclusions can be drawn concerning assessments of goal achievement, the development of the students, or the quality of the teachers. The teacher's tacit knowledge, which developed over a long shared history with the students, may have led to the form not containing all information relevant to the IEP goals (Rämä & Kontu, 2012).

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